Determinants of leisure time physical activity in rural compared with urban older and ethnically diverse women in the United States

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Abstract

***Study objective*—Determinants of leisure time physical activity (LTPA) in rural middle aged and older women of diverse racial and ethnic groups are not well understood. This study examined: (1) urban-rural differences in LTPA by sociodemographic factors, (2) urban-rural differences in LTPA determinants, and (3) the pattern of relations between LTPA determinants and LTPA.**

***Design*—A modified version of the sampling plan of the Behavioral Risk Factor Surveillance Survey (BRFSS) was used. Zip codes were selected with 20% or more of each of the following race/ethnic groups: African American, American Indian/Alaskan Native (AI/AN), and Hispanic. A comparison group of white women were also surveyed using standard BRFSS techniques.**

***Participants*—Rural (n=1242) and urban (n=1096) women aged 40 years and older from the US Women's Determinants Study.**

***Main results*—Rural women, especially Southern and less educated women, were more sedentary than urban women. Rural women reported more personal barriers to LTPA, cited caregiving duties as their top barrier (compared with lack of time for urban women), and had greater body mass indices. Rural women were less likely to report sidewalks, streetlights, high crime, access to facilities, and frequently seeing others exercise in their neighbourhood. Multivariate correlates of sedentary behaviour in rural women were AI/AN and African American race, older age, less education, lack of enjoyable scenery, not frequently seeing others exercise, greater barriers, and less social support ($p<0.05$); and in urban women, older age, greater barriers, less social support ($p<0.05$), and less education ($p<0.09$).**

***Conclusions*—Rural and urban women seem to face different barriers and enablers to LTPA, and have a different pattern of determinants, thus providing useful information for designing more targeted interventions.**

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Physical inactivity is a major public health problem in the United States and other industrialised nations and is responsible for substantial disease burden.[1] Regular leisure time physical activity (LTPA) has well documented health benefits, including control of diabetes mellitus and obesity, and reduction in hypertension and morbidity/mortality from cardiovascular disease and some forms of cancer.[2] However, at least 60% of adults in the United States are not regularly active at the recommended level for health.[2] Segments of the US population that are least active include women, older adults, those of lower socioeconomic status, and ethnic minorities.[2 3] Furthermore, a recent report from the Centers for Disease Control and Prevention[4] indicated that physical inactivity was highest in rural areas (37%) and lowest in metropolitan areas (27%), with some regional differences.

About one quarter of the US population lives in rural settings.[5] Although the life circumstances of rural adults are diverse, rural residents often face more severe barriers to health promotion than non-rural residents, including higher rates of poverty, greater distance to travel for health care and other services, lower levels of education, and possibly higher rates of chronic disease.[5 6] These barriers may be even more pronounced in women, older adults, and ethnic minorities.[5]

There is evidence that rural adults as a group tend to have high rates of inactivity,[7–9] are less active than their urban counterparts,[4 10] and have less interest in increasing their activity levels.[11] Not all studies, however, have supported these findings,[12] and one study found higher levels of physical activity in rural versus urban and suburban adults.[13] LTPA in rural diverse ethnic groups, particularly American Indian/Alaskan Native, Hispanic, and Asian, have been minimally studied.

The determinants of LTPA in rural populations have received even less study than the prevalence, and most studies have focused on sociodemographic correlates such as age and gender.[12 14 15] In contrast, Horne[16] reported that intention to exercise, self efficacy, perceived barriers, and social support were related to LTPA in rural homemakers.

Studies of LTPA among rural versus urban adults have been infrequent and have yielded inconsistent results. Furthermore, most have not examined a wide range of determinants and have been limited to one geographical region. Our investigation extends the current literature by examining determinants of LTPA in a sample of ethnically diverse rural and urban middle aged (40–64 years) and older (65+ years) women, across the US, using representative sampling.

Table 1 Sociodemographic, health related, psychosocial, environmental, and physician counselling variables assessed

Determinant	*Possible responses*	*Coding*
Sociodemographic factors		
1 Race/ethnicity	White African American American Indian/Alaskan Native Hispanic	Dummy coded with White=reference group
2 Age	40+ years	Continuous variable
3 Education level	⩽ high school education > high school education	Dummy coded with 0= ⩽ HS; 1= > HS
4 Geographical region	Northeast Midwest South West	Dummy coded with West=reference group
Health related factors		
1 Number of days of past 30 that health was not good	0+ days	Dummy coded with 0=0 days; 1=1+ days
2 Limitation because of any impairment or health problem	Yes No	0=no, 1=yes
3 Body mass index	Weight (kg) / height $(m)^2$	kg/m^2
Psychosocial factors		
1 Perceived barriers to LTPA:	Rated the frequency of each barrier	1=never, 2=rarely, 3=sometimes, 4=often, 5=very often
Others discourage Self consciousness about appearance Fear of injury Lack of time Too tired Lack a safe place Caregiving duties Poor weather Health problems Lack energy	Number of items rated as "often" or "very often" were summed	Possible range: 0–10, with a higher number indicating more barriers rated as "often" or "very often"
2 Social support for LTPA from family and friends	Rated social support on 4 items.	1=strongly agree, 2=agree, 3=disagree, 4=strongly agree
	Items were summed to provide an overall measure of social support for LTPA	Possible range: 4–16, with higher scores indicating less social support
Environmental factors		
1 Sidewalks 2 Heavy traffic 3 Hills 4 Streetlights 5 Unattended dogs 6 Enjoyable scenery 7 Frequently observe others exercising 8 High levels of crime 9 Easy access to walking trails, swimming pools, recreation centres, or bicycle paths	Rated the presence or absence of each factor	0=absent; 1=present
Physician advice to exercise	Indicated whether advised by a physician, in the past year, to exercise more	0=no; 1=yes

The objectives of this paper are to: (1) examine urban-rural differences in LTPA by sociodemographic factors, (2) investigate urban-rural differences in potential determinants of LTPA, consistent with social cognitive and ecological theories,[17–19] that have been shown to be important determinants of LTPA in other population-based studies,[20–22] and (3) examine the pattern of relations between potential determinants and LTPA among women residing in rural versus urban regions of the US.

Methods

OVERVIEW OF THE POPULATION SURVEY

Our data were collected as part of the US Women's Determinants Study.[10 23] The methods for this study have been described in detail elsewhere,[23] and are briefly discussed here. The study surveyed 2912 women aged 40 years and older by telephone, using a modified version of the sampling plan of the Behavioral Risk Factor Surveillance Survey (BRFSS).[24–26] To obtain a nationally representative sample of minority women in a cost efficient manner, zip codes were selected with 20% or more of each of the following racial/ethnic categories: African American, American Indian/Alaskan Native, and Hispanic. For comparison purposes, a group of white women of the same age group was also surveyed. Identified zip codes were computer matched with telephone prefixes, and a standard multi-stage cluster technique for random telephone numbers was subsequently applied, as in the standard BRFSS.[23] A zip code screening question was included at the start of the survey for verification purposes.

Because this paper focused specifically on urban-rural differences in LTPA, the sample was restricted to women classified as either urban (n=1096) or rural (n=1242) who could be classified into one of three LTPA levels. Women from other residences (n=487) and women whose LTPA could not be classified because of missing data (n=87) were excluded from all analyses.

The survey was developed based on questions from the BRFSS, the National Health Interview Survey (NHIS), and other surveys.[24 25 27–32] Intact valid and reliable scales were used when they were available.[23] The survey consisted of up to 92 questions (sometimes less because of skip patterns), and took 29 minutes, on average, to administer.

Data were collected over a one year period, from July 1996 to June 1997.[23] Experienced interviewers conducted the interviews. The survey response rate was 87.3%.[33]

Table 2 Characteristics of urban and rural women participating in the US Women's Determinants Study

	Urban		*Rural*			
	Number	*%*	*Number*	*%*	χ^2	*(df, n)*
Overall sample	1096		1242			
Geographical region					77.47*	3, 2338
Northeast	38	3.5	31	2.5		
Midwest**	245	22.4	160	12.9		
South**	536	48.9	827	66.6		
West	277	25.3	224	29.3		
Race/ethnicity					658.22*	3, 2338
White**	362	33.0	237	19.1		
African American**	361	32.9	277	22.3		
Hispanic**	336	30.7	111	8.9		
American Indian/Alaskan Native**	37	3.4	617	49.7		
Age (y)					6.99	3, 2338
40–49	430	39.2	486	39.1		
50–59	281	25.6	329	26.5		
60–69	208	19.0	269	21.7		
70+	177	16.1	158	12.7		
Education					67.43*	3, 2333
< high school**	228	20.9	394	31.8		
High school graduate**	312	28.5	416	33.5		
Some college/technical	270	24.7	229	18.5		
College graduate**	283	25.9	201	16.2		

*p<0.001 for overall χ^2 analysis. **p<0.001 for urban-rural comparison (conducted only if χ^2 was significant).

Table 3 Percentage of women living in urban and rural regions of the US who are sedentary and regularly active, by sociodemographic factors

	% Sedentary			*% Regularly active*		
	Urban	*Rural*	χ^2	*Urban*	*Rural*	χ^2
Overall	48.7	56.0	**12.21	10.2	8.5	1.76
Geographical region						
West	50.9	43.3	2.57	9.4	17.4	*6.37
Northeast	44.7	51.6	0.11	5.3	9.7	0.06
Midwest	53.5	53.1	0.00	8.2	10.6	0.44
South	45.7	60.2	**27.03	11.9	5.7	**16.19
Race/ethnicity						
White	44.2	48.5	0.91	11.9	9.3	0.75
African American	53.5	60.3	2.70	7.5	4.7	1.62
Hispanic	48.5	42.3	1.04	11.6	20.7	5.06
American Indian/Alaskan Native	48.6	59.5	1.27	8.1	7.8	0.06
Age (y)						
40–49	42.8	51.4	*7.15	12.8	8.0	5.12
50–59	45.2	56.5	*7.35	11.0	8.8	0.61
60–69	53.4	56.5	0.35	7.2	10.4	1.10
70+	63.3	67.1	**39.46	6.2	6.3	0.03
Education						
< high school	54.4	66.8	**8.87	8.8	6.9	0.51
High school graduate	57.1	56.0	0.04	8.3	7.9	0.00
Some college/technical	45.2	53.7	3.27	11.5	7.9	1.45
College graduate +	38.5	38.3	0.00	12.4	13.4	0.04

*p<0.01. **p<0.001. The proportion of women who are underactive can be obtained by summing the proportion sedentary and the proportion regularly active and subtracting from 100.

SURVEY ITEMS INCLUDED IN THE CURRENT REPORT

Leisure time physical activity

LTPA was assessed with items adapted from the NHIS and the BRFSS. Participants were asked if they engaged in any of a number of aerobic activities in the past two weeks, and if so, they were asked the number of sessions, minutes per session, and perception of increase in heart rate or breathing they experienced from the activity. Based on participant responses, LTPA was categorised into one of three levels. Sedentary was defined as no reported sports or exercise in the past two weeks, or no increase in heart rate reported from any activities engaged in. Active was defined as either: (a) three or more sessions per week of jogging/running, hiking, biking, swimming or dance, for at least 20 minutes per session, resulting in a medium to large increase in reported heart rate, or (b) five or more sessions per week, for at least 30 minutes per session, of any physical activities (including walking, gardening or yard work, calisthenics, etc) that resulted in at least some reported increase in heart rate. Underactive was defined as not meeting the criteria for sedentary or active. This classification is consistent with the current physical activity recommendations.[34]

Determinants of LTPA

As shown in table 1, we studied potential sociodemographic, health related, psychosocial, environmental, and physician counselling determinants of LTPA. The selection of variables was guided by previous research of important determinants of LTPA in different populations.[20 21 35 36] Urban/rural residence (based on 1990 US Census data) and geographical region (based on classification used in the CDC report)[4] were ascertained through the participants' reported zip codes.

STATISTICAL ANALYSES

After data collection, all data were cleaned and edited using standard BRFSS quality control procedures.[24 25] Pearson product moment correlations were conducted to evaluate collinearity among the independent variables.

Descriptive statistics were reported by residence status (urban and rural), and differences between urban and rural participants were tested with χ^2 for categorical variables and *t* tests for continuous variables. Because of the number of analyses, statistical significance was set at p<0.01.

Two separate simultaneous logistic regression analyses were conducted for urban and rural women. Separate analyses were undertaken to explore unique patterns of association between the independent variables and LTPA. Because relatively few women were classified as "active," the "underactive" and "active" categories were combined. Independent variables are shown in table 1. Physician advice to exercise, however, was not included in the regression analyses because of missing data for 312 women. A simultaneous regression analysis approach was used because multicolinearity was not a major problem, and it was important to examine whether potential determinants related to LTPA even after controlling for sociodemographic characteristics.

Results

SAMPLE CHARACTERISTICS

As shown in table 2, similar numbers of participants resided in urban and rural regions, just over 60% were 50 years of age or older, and less educated participants were well represented. Participants from the Midwest and those who were white, African American, or Hispanic were more likely to reside in urban areas. Participants from the South and American Indian/Alaskan Natives were more likely to reside in rural areas. Finally, rural participants were generally less educated than urban participants.

CORRELATIONS BETWEEN INDEPENDENT VARIABLES

The correlations between independent variables were generally low enough (*r*s<0.30) to

allow for entry of all variables described above into multivariate regression models.

Several exceptions are noted. Hispanic race was related to living in the West (r=0.45, p<.001). African American race was negatively related to the presence of sidewalks in one's neighbourhood (r=−0.34, p<0.001). Living in the South was negatively related to the presence of hills in one's neighbourhood (r=−0.37, p<0.001). Finally, participants who reported the presence of streetlights in their neighbourhood were more likely to report the presence of sidewalks (r=0.51, p<0.001).

Table 4 Urban compared with rural differences in reported health related variables, psychosocial variables, environmental characteristics, and physical advice to exercise

	Urban	*Rural*	*χ^2 or t*
Health related variables:			
Number of sick days in past month			
Mean	4.63	4.59	0.13
SD	(8.63)	(8.72)	
Physical limitation (%)	24.4	24.8	0.05
Body mass index (kg/m^2)	27.1	28.4	**−5.04
Psychosocial variables:			
Perceived barriers (% who reported the barrier "often" or "very often")			
Others discourage me	4.2	6.9	*7.62
Self conscious about appearance	19.4	18.6	0.23
Afraid of injury	12.9	17.1	*7.81
Lack of time	22.1	24.2	1.36
Too tired	19.8	23.4	4.36
Lack a safe place	17.8	22.5	*7.88
Caregiving duties	19.6	25.1	**10.33
Bad weather	8.9	10.9	2.64
Not in good health	14.8	17.5	2.94
Lack energy	21.0	23.9	2.84
Number of perceived barriers rated as occurring "often" or "very often"			
Mean	1.61	1.87	**−3.77
SD	(1.66)	(1.73)	
Social support for LTPA			
Mean	8.86	8.65	2.37
SD	(2.20)	(2.03)	
Environmental characteristics (%):			
Side walks	79.5	15.2	**971.59
Heavy traffic	41.3	39.1	1.16
Hills	29.3	25.6	3.89
Street lights	80.9	31.9	**564.10
Unattended dogs	33.6	54.2	**98.71
Enjoyable scenery	84.2	85.6	1.00
Frequently see others exercising	73.7	51.6	**120.61
High crime	26.0	15.8	**36.98
Access to facilities	84.4	64.2	**122.31
Physician advice to exercise (%):	34.0	35.4	0.42

*p<0.01. **p<0.001. Higher scores on the social support scale indicate less support.

Table 5 Multivariate correlates of a sedentary lifestyle: simultaneous logistic regression analyses for urban and rural women

	Urban		*Rural*	
	Odds ratio	*95% CI*	*Odds ratio*	*95% CI*
Sociodemographic characteristics:				
Race/ethnicity (ref=White)				
African-American	0.76	0.51, 1.12	*0.65	0.43, 1.00
American Indian/Alaskan Native	0.58	0.25, 1.35	*0.57	0.40, 0.81
Hispanic	0.83	0.58, 1.17	0.66	0.35, 1.23
Geographical region (ref=West)				
Northeast	1.80	0.81, 3.97	0.80	0.33, 1.96
Midwest	1.16	0.71, 1.89	0.70	0.40, 1.22
South	1.21	0.85, 1.71	0.69	0.41, 1.16
Age	*0.98	0.97, 0.99	*0.99	0.97, 1.00
Education	1.29	0.97, 1.72	*1.53	1.16, 2.01
Neighbourhood characteristics:				
Side walks	1.12	0.78, 1.60	0.97	0.65, 1.45
Heavy traffic	1.08	0.81, 1.44	0.93	0.71, 1.22
Hills	1.26	0.92, 1.73	1.21	0.84, 1.75
Street lights	1.00	0.70, 1.42	1.02	0.75, 1.38
Unattended dogs	1.28	0.95, 1.72	1.09	0.84, 1.42
Enjoyable scenery	1.29	0.88, 1.89	*1.71	1.16, 2.53
Frequently see others exercising	1.12	0.80, 1.55	*1.39	1.06, 1.81
High crime	0.90	0.65, 1.25	1.09	0.76, 1.57
Access to exercise facilities	0.96	0.65, 1.42	1.09	0.81, 1.41
Psychosocial factors:				
Personal barriers	*0.86	0.79, 0.94	*0.84	0.78, 0.91
Social support for LTPA	*0.86	0.81, 0.92	*0.86	0.80, 0.92
Health variables:				
Number of sick days	1.21	0.90, 1.61	0.93	0.70, 1.22
Physical limitation	0.93	0.66, 1.31	0.80	0.58, 1.11
Body mass index	0.99	0.97, 1.02	1.01	0.99, 1.04

*p<0.05. 95% CI represents 95% confidence intervals for the odds ratio. Higher scores on social support for exercise indicate less support. Odds ratios are adjusted for all other independent variables in the model.

RURAL-URBAN DIFFERENCES IN LTPA LEVELS, BY SOCIODEMOGRAPHIC FACTORS

Overall, rural women were more likely to be classified as sedentary than urban women (as reported in Brownson *et al*.[10]) As shown in table 3, rural women from the South and those with less education were more likely to be classified as sedentary than their urban counterparts. At most age groups, rural women were more likely to be classified as sedentary than urban women. Rural participants who were Southern, African American, and less educated, as well as older (70+ years) urban and rural participants had particularly high rates of sedentary behaviour (60% or greater).

There was no overall urban-rural difference in the proportion of participants classified as regularly active. However, rural women from the West were more likely to be classified as active than their urban counterparts, whereas rural women from the South were less likely to be classified as active than their urban counterparts. Differences between urban and rural women approached statistical significance (ps=0.02) for Hispanic race (rural more active than urban) and age of 40–49 years (urban more active than rural).

URBAN-RURAL DIFFERENCES IN LTPA DETERMINANTS

As shown in table 4, rural women reported a greater number of frequent barriers to LTPA than urban women. In particular, rural women were more likely than urban women to state that others discouraged them from exercising, that they were afraid of injury, lacked a safe place to exercise, and had caregiver duties that interfered with exercise. Furthermore, for urban women, the top three barriers to LTPA, in order, were lack of time, lack of energy, and being too tired. For rural women, the top three barriers, in order, were caregiving duties, lack of time, and lack of energy. In terms of environmental characteristics, urban women were more likely than rural women to report the presence of sidewalks, streetlights, high crime, access to exercise facilities, and frequently seeing others exercise in their neighbourhood, whereas rural women were significantly more likely to report the presence of unattended dogs. Rural women also had higher body mass indices than urban women. No additional urban-rural differences were found.

CORRELATES OF SEDENTARY BEHAVIOUR AMONG URBAN AND RURAL WOMEN: LOGISTIC REGRESSION ANALYSES

Urban women

As shown in table 5, older age, greater perceived barriers to LTPA, and less social support were independently associated with sedentary behaviour in urban women (model: χ^2 (22, n=955)=74.81, p<0.001). There was

also a trend (p=0.08) for less education to be associated with sedentary behaviour.

Rural women

American Indian/Alaskan Native and African American race, older age, less education, not having enjoyable scenery in one's neighbourhood, not frequently seeing others exercise in one's neighbourhood, greater perceived barriers to LTPA, and less social support for exercise from family and friends were independently associated with sedentary behaviour among rural women (model: χ^2 (22, n=1085)=119.31, p<0.001).

KEY POINTS

- This paper examined determinants of LTPA for middle aged and older rural compared with urban women from diverse ethnic/racial backgrounds in the US.
- Rural women, especially Southern and less educated rural women, were more sedentary than urban women.
- Rural women reported more barriers to LTPA than urban women, and caregiving responsibilities were cited as the most common barrier.
- A different pattern of LTPA determinants were found for rural versus urban US women, suggesting the need for tailored interventions.

Discussion

This study is unique in that it examined the prevalence and determinants of LTPA in some of the most sedentary and understudied populations of the US, namely, older, ethnically diverse, low socioeconomic, and rural women. Overall, our results confirm that traditional social cognitive and ecological variables that have been found to be determinants of LTPA in general population studies (that is, perceived barriers, social support, environmental factors) are also relevant to the LTPA patterns of rural and urban women from varied ethnic and racial origins.

The finding that rural women experience more frequent perceived barriers to LTPA than urban women is important, and is consistent with population-based prevalence rates of inactivity in rural adults.[4] In particular, caregiving duties were identified as a barrier to LTPA by the largest percentage of rural women. Caregivers are typically unable to leave their care recipient unaccompanied, making home-based interventions[37] ideal for this population. Although it is not clear how much physical activity caregivers get from the physical demands inherent in this role, it is probable that they are not routinely participating in sustained activities that increase heart rate. Lack of time and energy and caregiving responsibilities, barriers frequently cited by both rural and urban women, probably reflect the role strain faced by many of these women.[38] Thus, consistent with current recommendations,[2 34] activities that can be incorporated into a woman's daily life, such as multiple shorter bouts of physical activity, may be more appealing to both urban and rural women.

Social support is a commonly reported determinant of physical activity.[22] This study extends the importance of social support to ethnically diverse older women who reside in urban and rural areas. We did not find a significant relation between poor health or having a physical limitation and sedentary behaviour, even though this relation has been reported in other studies.[21] It may be that other factors were more important or that our measures of physical health were not specific enough.

Environmental factors are thought to influence physical activity, but there has been little empirical study of these factors.[19 39] Frequently seeing others exercise was less common in rural neighbourhoods, and this factor was independently related to sedentary behaviour. Bandura's[17] social cognitive theory discusses the importance of role models in influencing behaviour. The lack of physically active role models in rural areas, whether real or perceived, is thus important and suggests that neighbourhood-based or community-based interventions may be most successful. The significant relation found between enjoyable scenery and LTPA suggests that green space may be an important environmental factor influencing LTPA. More detailed evaluations of physical environment are warranted in future studies.

The relation between sociodemographic characteristics of ethnicity, age, and education with LTPA found in this study are consistent with other reports,[2 3] and the finding that rural Southern women were more sedentary than their urban counterparts is consistent with a recent CDC report.[4] Although these are immutable factors, the presence of high rates of sedentary behaviour in these groups supports the need for increased efforts to reach out to these underserved groups in innovative ways. The higher rates of sedentary behaviour among American Indian/Alaskan Native and African American women draw attention to the probable influence of cultural norms on physical activity. We need to better understand the lifestyle, social, and cultural factors specific to rural American Indian/Alaskan Native and African American women that may limit their participation in LTPA (for example, different cultural preferences for physical activities, lack of available facilities or information on physical activity). Additionally, research on physical activity in these ethnic subgroups must show cultural sensitivity in measurement, as "traditional" measures may not necessarily assess culturally-based forms of physical activity and may underestimate activities spent in domestic and child/elder care.[40]

There are several limitations to this study. All data were collected through telephone interviews, which may result in undersampling of some minority and low income groups who do not own telephones, and overrepresentation of certain types of ethnic subgroups (for example, American Indians living on reservations)[23] because of the reliance on zip codes containing 20% or more of a racial/ethnic group. However, 1990 Census information indicates that the zip

codes that were sampled had relatively high telephone coverage (86–93%), and the sampling method resulted in a representative distribution of minority and low income women.[23] Unfortunately, Asian women were not included in the sample because insufficient numbers were able to be telephone interviewed during the survey pilot phase. Also, the telephone survey was only conducted in English, and as a result, Spanish speaking women without English language skills were excluded. Another limitation to the study results is that Northeasterners, rural Hispanics and Midwesterners, and urban American Indian/Alaskan Natives were underrepresented. Finally, we did not specifically consider occupational or household activities, with the exception of yardwork, gardening, and the like, although these activities may be particularly relevant to the lives of women.[40]

To date, few studies have examined the determinants of LTPA in rural middle aged and older women. Determinant studies such as ours are important as a first step in designing interventions that meet the unique needs of understudied groups. Our results indicate the importance of sociodemographic, psychosocial, environmental, and health characteristics in influencing LTPA in older urban and rural women. In addition, the different patterns of results for urban compared with rural women offer information that could be of use in setting research priorities for at risk groups (for example, American Indian/Alaskan Native women, rural African American women, less educated rural women) and for designing interventions tailored to the barriers and enablers to LTPA experienced by these groups.

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